

REMARKS

I. CLAIM CHANGES

Claim 1, which did not claim an optical glass with a specific glass composition, has now been amended to include a lanthanate borate glass comprising a glass composition with broad concentration ranges as disclosed on pages 8 to 11 of the applicants' originally filed specification.

The location for support in the applicants' specification for the various oxide ingredient concentration ranges is given in the following table:

OXIDE INGREDIENT	RANGE	SUPPORT LOCATION
La ₂ O ₃	30 to 55	p. 8, line 21
B ₂ O ₃	20 to 40	p. 8, line 22
SiO ₂	0 to 8	p.10, lines 8 - 9
PbO	0 to 5	p.10, line 9
MgO	0 to 8	p. 11, lines 8 - 9
CaO	0 to 8	p. 11, lines 8 - 9
SrO	0 to 8	p. 11, lines 8 - 9
BaO	0 to 8	p. 11, lines 8 - 9
ZnO	0 to 10	p. 9, lines 15 -16
TiO ₂	0 to 5	p. 11, line 8
ZrO ₂	0 to 10	p. 9, line 21
GeO ₂	0 to 15	p. 10, line 9
Y ₂ O ₃	0 to 11	p. 9, lines 20 - 21
Yb ₂ O ₃	0 to 5	p. 10, last line
Gd ₂ O ₃	0 to 5	p. 11, line 9
Nb ₂ O ₅	0 to 10	p. 9, line 20
Σ alkaline earth oxides	0 to 10	p. 11, line 14

Thus the amended claim 1 is fully supported by the disclosures in the specification.

Claims 17, 18, 19, and 20, which included preferred lanthanate borate glass compositions and which depended on claim 1, were amended to include the features and limitations of the previously pending claim 1. Also the glass composition of claim 20 was amended to change the transitional word "consisting of" to the transitional word "comprising" so that the glass compositions of claim 20 does not exclude additional oxide ingredients.

Claim 19 has been further amended by reducing the upper limit for the TiO₂ concentration range from 3.0 wt. % to 1.0 wt. %. This change is fully supported by example 18 on page 26 of the applicants' originally filed specification and the policy regarding changes to concentration ranges in composition claims during prosecution according to M.P.E.P. 2163.05 III and the *In re Wertheim* decision.

The amended claims 17, 18, 19, and 20 are fully supported by the disclosures regarding the glasses of the first to fourth classes on pages 12 to 22 of the applicants' originally filed specification.

Thus all claim changes are fully supported by the disclosures in the applicants' specification.

II. ALLOWABLE SUBJECT MATTER

Dependent claims 17, 18, and 20 were found to contain allowable subject matter according to page 5 of the Office Action. These claims depended on claim 1 and were amended to include the subject matter of claim 1 so that they are now independent claims. The indication of allowable subject matter is gratefully acknowledged.

III. INDEFINITENESS REJECTION

Claims 1 to 3 were rejected as indefinite under 35 U.S.C. 112, second paragraph, because they did not set forth a specific composition of the optical glass.

As noted above, claim 1 has been amended to claim a broad glass composition according to pages 8 to 11 of the originally filed specification.

For the foregoing reasons withdrawal of the rejection of claims 1 to 3 as indefinite under 35 U.S.C. 112, second paragraph, is respectfully requested.

IV. RELATIONSHIP OF THE AMENDED CLAIMS 17 TO 20 TO THE ART

Claims 1 to 3 and 16 were rejected as anticipated under 35 U.S.C. 102 (b) by German Patent 3130715 ("Shizuo"), by JP 61-163138 ("Matsumaru"), by US

Patent 4,118,238 ("Ishibashi 1"), by US Patent 4,226,627 ("Inoue"), or by US Patent 4,166,746 ("Ishibashi 2"). Claim 19 was also anticipated by Ishibashi 2.

1. CLAIM 17

Claim 17 was found to contain allowable subject matter according to page 5 of the Office Action because the glass composition according to claim 17 was defined as "consisting of" the recited oxide ingredients.

Because of the use of the "consisting of" transitional wording, claim 17 excluded required ingredients of the various glass compositions of the prior art. For example, the "consisting of" wording of claim 17 excluded the required fluorine content of Shizuo (abstract and page 5, lines 30 to page 6, line 14, of Shizuo), which is essential for the improvements according to Shizuo, and the required SiO₂ content of Inoue (column 1, line 43). The concentration ranges of Matsumaru for Yb₂O₃ and for Al₂O₃ do not overlap the corresponding concentration ranges in the glass composition according to amended claim 17. Claim 17 excludes the required fluorine content in the glass composition of Ishibashi 1. Ishibashi 1 does not disclose a glass containing Yb₂O₃, which is a required ingredient in the glass of claim 17. Ishibashi 2 also does not mention Yb₂O₃, which is a required ingredient in the glass of claim 17. Claim 17 excludes other oxide ingredients of Ishibashi 2, such as Ta₂O₅ (present in 1/2 of the examples of Ishibashi 2). Also the glass composition of Ishibashi 2 contains from 2 to 35 wt. % B₂O₃ (their broadest concentration range) in comparison to 30 to 40 wt. % for the glass of claim 17, which does not constitute a teaching of the

applicants' B₂O₃ with 'sufficient specificity' for an anticipation rejection according to M.P.E.P. 2131.03.

Accordingly it is respectfully submitted that **none** of the prior art references of record establish a *prima facie* case of anticipation or obviousness of the amended independent claim 17, which now contains the limitations of claim 1.

2. CLAIM 18

Claim 18 was found to contain allowable subject matter according to page 5 of the Office Action because the glass composition according to claim 18 was defined as "consisting of" the recited oxide ingredients.

Because of the use of the "consisting of" transitional wording, claim 18 excluded required ingredients of the various glass compositions of the prior art. For example, the "consisting of" wording of claim 18 excluded the required fluorine content of Shizuo (abstract and page 5, lines 30 to page 6, line 14, of Shizuo), which is essential for the improved properties of their invention, and also excluded the required Yb₂O₃ and SnO₂ content of Inoue (column 2, lines 40 to 49, of Inoue). Claim 18 excludes Yb₂O₃ from the claimed glass composition, but Matsumaru requires a minimum of 5 wt. % of Yb₂O₃. The concentration range of Matsumaru for Al₂O₃ does not overlap the corresponding concentration range in the glass composition according to amended claim 18.

Also claim 18 excludes the required fluorine content in the glass composition of Ishibashi 1 (abstract and claim 1), which this prior art reference

teaches is essential for the improved properties of their invention (claim 1, lines 45 to 50, of Ishibashi 1). Although the Y₂O₃ concentration range for Y₂O₃ in the abstract of Ishibashi 1 is 4 to 31 wt. %, it barely overlaps the concentration range for Y₂O₃ of 0.1 to 6 wt. % in claim 18 and Ishibashi 1 thus does not teach the applicants' range for Y₂O₃ with sufficient specificity for an anticipation rejection according to M.P.E.P. 2131.03. Ishibashi 2 discloses glass composition in which TiO₂ is an essential required ingredient with a minimum content of 2 wt. %, whereas the amended claim 18 excludes TiO₂ from the glass composition. Also the broad Y₂O₃ concentration range in the glass of column 2, lines 55 to 65, of 2 to 29 does not disclose the range for Y₂O₃ in claim 18 with sufficient specificity for an anticipation rejection.

Accordingly it is respectfully submitted that none of the prior art references of record establish a *prima facie* case of anticipation or obviousness of the amended independent claim 18, which now contains the limitations of claim 1.

3. CLAIM 19

Claim 19 has been amended to reduce the upper limit for the TiO₂ concentration range from 3.0 wt. % to 1.0 wt. % (the support for this change is example 18 on page 26 of the applicants' specification). It is respectfully submitted that the amended claim 19 is not anticipated by the five prior art references of record, because the glass composition according to amended independent claim 19 is defined as "consisting of" the recited oxide ingredients.

Because of the use of the "consisting of" transitional wording, claim 19 excludes required ingredients of the various glass compositions of the prior art. For example, the "consisting of" wording of claim 19 excludes the essential required fluorine content of Shizuo (abstract and page 5, lines 30 to page 6, line 14, of Shizuo) and the required Yb₂O₃ and SnO₂ content of Inoue (column 2, lines 40 to 49, of Inoue). The amended claim 19 excludes Yb₂O₃ from the claimed glass composition, but Matsumaru requires a minimum of 5 wt. % of Yb₂O₃. In addition the concentration range of Matsumaru for Al₂O₃ does not overlap the corresponding Al₂O₃ concentration range in the glass composition according to amended claim 19 so that an anticipation could not be based on Matsumaru even without the required Yb₂O₃ content.

Also claim 19 excludes the required fluorine content in the glass composition of Ishibashi 1 (abstract and claim 1), which this prior art reference teaches is essential for the improved properties of their invention, even in only small amounts (claim 1, lines 45 to 50, of Ishibashi 1).

Ishibashi 2 discloses and claims a glass composition containing from 2 to 19 wt. % of TiO₂ as well as B₂O₃ and La₂O₃. The reference teaches that a minimum of 2 wt. % TiO₂ is required to prevent devitrification at column 3, lines 7 to 8. Thus TiO₂ at amounts of 2 wt. % or greater is absolutely required according to Ishibashi 2, whereas applicants limit the amount of TiO₂ to 0 to 1 wt. %. Ishibashi 2 thus does not disclose a glass in which all the concentration ranges for the required ingredients overlaps or touches the corresponding range in the

glass composition as defined in claim 19 and thus Ishibashi 2 cannot establish a case of *prima facie* anticipation of the amended claim 19.

Also the concentration range for ZnO of claim 19 of 0.5 to 6 wt. % is not anticipated or disclosed by Ishibashi 2. There is no individual range for ZnO disclosed in Ishibashi 2 and ZnO is not part of the claimed glass composition. Ishibashi 2 only discloses from 0 to 24 wt. % of RO in general where RO can be alkaline earth oxides ZnO and PbO. ZnO helps to prevent devitrification in the claimed glass compositions of the third class (claim 19) according to the applicants' specification on page 9.

Thus Ishibashi 2 does not teach the ZnO concentration range of claim 19 with sufficient specificity for an anticipation rejection according to M.P.E.P. 2131.03.

Accordingly it is respectfully submitted that **none** of the prior art references of record establish a *prima facie* case of anticipation or obviousness of the amended independent claim 19, which now contains the limitations of claim 1.

4. CLAIM 20

Claim 20 was found to contain allowable subject matter according to page 5 of the Office Action. Accordingly the limitations of claim 1 have been included in claim 20 so that it is now an independent claim.

Furthermore the glass composition is now defined with "comprising" wording instead of "consisting of" wording so that it does not exclude the

presence of additional oxide ingredients that are not recited in the claims. Nevertheless it is respectfully submitted that the amended claim 20 is easily allowable over the five prior art references that were used to reject the previously pending claim 1 as anticipated. The reason is that the glass composition of claim 20 contains only from 1 to 8 wt. % of B_2O_3 which does not overlap and indeed is well separated from the corresponding concentration ranges for B_2O_3 of Shizuo, Matsumaru, Inoue and Ishibashi 2. Only the broad B_2O_3 concentration range of Ishibashi 1 overlaps that of the glass composition of claim 20, but the concentration range of La_2O_3 of the glass composition of claim 20 does not overlap that of US '238. Furthermore the upper limit of that concentration range for claim 20 is 14 percentage points separated from the lower limit of Ishibashi 1. Also the glass composition of claim 20 must contain from 20 to 30 wt. % of SiO_2 but SiO_2 is not even an optional ingredient in the glass of Ishibashi 1.

Although absolute predictability is not required for a rejection under 35 U.S.C. 103 (a), at least some predictability is required. See M.P.E.P.2143.03. It is respectfully submitted one could not reasonably predict that the large number of modifications of oxide ingredient concentrations for the comparatively large number of oxide ingredients of the glass compositions disclosed in the five prior art references of record would produce an optical glass with the desirable properties of applicants' glass composition.

Accordingly it is respectfully submitted that **none** of the prior art references of record establish a *prima facie* case of anticipation or obviousness

of the amended independent claim 20, which now contains the limitations of claim 1 and uses "open-ended" wording to define the glass composition.

It is respectfully submitted that the **amended** claims 17, 18, 19, and 20 should **not** be rejected as anticipated under 35 U.S.C. 102 (b) by or obvious under 35 U.S.C. 103 (a) over German Patent 3130715 ("Shizuo"), JP 61-163138 ("Matsumaru"), US Patent 4,118,238 ("Ishibashi 1"), US Patent 4,226,627 ("Inoue"), or US Patent 4,166,746 ("Ishibashi 2").

V. RELATIONSHIP OF THE AMENDED CLAIM 1 TO THE PRIOR ART

Claims 1 to 3 and 16 were rejected as anticipated under 35 U.S.C. 102 (b) by German Patent 3130715 ("Shizuo"), by JP 61-163138 ("Matsumaru"), by US Patent 4,118,238 ("Ishibashi 1"), by US Patent 4,226,627 ("Inoue"), or by US Patent 4,166,746 ("Ishibashi 2").

Claim 1 has been amended as shown and described above to overcome the indefiniteness rejection and further distinguish its subject matter from the cited prior art.

In accordance with M.P.E.P. 2131.03 the aforesaid prior art references would **only** anticipate the amended claim 1 if they teach a glass composition with respective concentration ranges that overlap or touch the corresponding ranges and if the corresponding concentration ranges of the prior art correspond with "**sufficient specificity**" to those of the amended claim 1.

It is respectfully submitted that none of the prior art references of record teaches all concentration ranges of all oxide ingredients of the glass compositions of the amended claim 1 with 'sufficient specificity' for an anticipation rejection.

Shizuo teaches a range of from 1 to 32 wt. % for Yb_2O_3 which is 6 times the breadth of the corresponding range of amended claim 1, namely 0 to 5 wt. %. Thus it is respectfully submitted that Shizuo does not teach all concentration ranges of the amended claim 1 with **sufficient specificity** for an anticipation rejection under M.P.E.P. 2131.03.

Inoue teaches a range of from 1 to 35 wt. % for Yb_2O_3 which is 7 times the breadth of the corresponding range of amended claim 1, namely 0 to 5 wt. %. Thus it is respectfully submitted that Inoue does not teach all concentration ranges of the amended claim 1 with **sufficient specificity** for an anticipation rejection under M.P.E.P. 2131.03.

Matsumaru teaches a concentration range of from 5 to 50 wt. % for Yb_2O_3 which is 10 times the breadth of the corresponding range of amended claim 1, namely 0 to 5 wt. % and also which only touches the range of amended claim 1. The amounts of Yb_2O_3 in the glass of Matsumaru are generally much larger than in the glass of amended claim 1. Thus it is respectfully submitted that Matsumaru does not teach all concentration ranges of the amended claim 1 with **sufficient specificity** for an anticipation rejection under M.P.E.P. 2131.03.

Ishibashi 2 teaches a concentration range of 2 to 19 wt. % for TiO_2 , whereas the concentration range of the amended claim 1 for TiO_2 is only 0 to 5

wt. %. Also Ishibashi 2 teaches a concentration range of 0 to 24 for Gd_2O_3 but the corresponding concentration range of amended claim 1 is 0 to 5 wt. %. Thus it is respectfully submitted that Ishibashi 2 does not teach all concentration ranges of the amended claim 1 with **sufficient specificity** for an anticipation rejection under M.P.E.P. 2131.03.

Ishibashi 1 teaches a concentration range for Y_2O_3 of 4 to 31 wt. %, whereas the corresponding range in the amended claim 1 is from 0 to 11 wt %. Also Ishibashi 1 teaches a concentration range of 0 to 12 for Gd_2O_3 but the corresponding concentration range of amended claim 1 is 0 to 5 wt. % (almost a third of the width of the Ishibashi range). Thus it is respectfully submitted that Ishibashi 1 does not teach all concentration ranges of the amended claim 1 with **sufficient specificity** for an anticipation rejection under M.P.E.P. 2131.03.

Thus it is respectfully submitted that the amended claim 1 is not anticipated by any of the above-cited five prior art references.

With respect to a possible obviousness rejection none of the five prior art references teach the limitation that the density must be less than or equal to 4.5 g/cm³. First since the concentration ranges for the heavy element oxides such as Yb_2O_3 and Gd_2O_3 are much less than the corresponding amount ranges of the prior art references, one would expect that the glasses of the prior art references encompass embodiments that do **not** satisfy this low density limitation. In some embodiments 30 wt % or more of the glass could be Yb_2O_3 .

For that reason one skilled in the art would not expect all embodiments of

the glass compositions of each of the five prior art references to satisfy the density limitation of amended claim 1. For example one embodiment of the glass composition disclosed by Matsumaru could comprise 50 % La_2O_3 and 50 % Yb_2O_3 and it is very unlikely that this embodiment could have a density of less than or equal to 4.5 g/cc. Yb_2O_3 and La_2O_3 have a density of about 9.2 g/cc and 6.5 g/cc respectively according to the Handbook of Chemistry and Physics.

These five prior art references do not disclose or suggest that the optical glass of the amended claim 1 has a density of less than or equal to 4.5 g/cc.

Furthermore for a valid rejection based on disclosed prior art references the prior art must put the claimed invention in the hands of the public, i.e. it must enable one skilled in the art to arrive at the claimed invention without an undue or unreasonably great amount of experimentation.

It is respectfully submitted that despite overlapping concentration ranges the five prior art references would not put the applicants' claimed invention with the low densities in the hands of the public because an undue amount of experimentation would be required to arrive at the concentration ranges of the low-density optical glass according to amended claim 1.

The density of the optical component is of great significance for the preferred application of the applicants, namely the read-write head. The heavier the optical glass component, the slower the data transfer time because of the greater inertia of the movable part of the device including the glass component. For example, page 5, lines 3 to 9, of the applicants' specification are as follows:

"The density of the optical materials of these systems is of great significance. The pick-up lenses acting as components of the read-write head are moving elements

of the system. The head moves over the recording medium for individual data transfer operations. The retrieval time and track densities thus depend on rapid and exact positioning of the head. The greater is the density of the glass components, the greater the mass of this mobile unit. Thus it has greater inertia and is more slowly put in position for the data transfer."

This passage from the applicants' specification clearly points out the great significance of the density limitation for the applicants' optical glass.

For the foregoing reasons and because of the changes in claim 1, withdrawal of the rejection of claim 1 as anticipated under 35 U.S.C. 102 (b) by German Patent 3130715 ("Shizuo"), JP 61-163138 ("Matsumaru"), US Patent 4,118,238 ("Ishibashi 1"), US Patent 4,226,627 ("Inoue"), or US Patent 4,166,746 ("Ishibashi 2") is respectfully requested.

It is also respectfully submitted that the amended claim 1 should not be rejected as obvious under 35 U.S.C. 103 (a) over German Patent 3130715 ("Shizuo"), JP 61-163138 ("Matsumaru"), US Patent 4,118,238 ("Ishibashi 1"), US Patent 4,226,627 ("Inoue"), or US Patent 4,166,746 ("Ishibashi 2").

Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such amendments or corrections be carried out by Examiner's Amendment and the case passed to issue. Alternatively, should the Examiner feel that a personal

discussion might be helpful in advancing the case to allowance, he or she is invited to telephone the undersigned at 1-631-549-4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,



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